

Dr. Jonathan B. Ajo-Franklin

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BACKGROUND

- Applied geophysics with a focus on problems related to energy and the environment.
- Core expertise in seismic imaging algorithms, novel timelapse measurements, borehole seismology, distributed acoustic sensing, experimental rock-physics, and synchrotron imaging techniques.
- Broad knowledge of coupled subsurface processes including hydrogeology, geochemistry, and reservoir microbiology, as relevant to geophysical monitoring.

EDUCATION

Ph.D.	2005	Geophysics	Stanford University	(Advisor Jerry M. Harris)
M.S.	2003	Geophysics	Stanford University	(Advisor Jerry M. Harris)
B.A.	1998	Computer Science & History	Rice University	

PROFESSIONAL POSITIONS

2013 - Present	Staff Scientist	Lawrence Berkeley National Laboratory
2007 - 2013	Research Scientist	Lawrence Berkeley National Laboratory
2005 - 2007	Post-Doctoral Fellow	Earth Resources Laboratory, MIT

JOURNAL PUBLICATIONS

1. Deng, H., Voltolini, M., Molins, S., Steefel, C., DePaolo, D., **Ajo-Franklin, J.**, and L. Yang, "Fracture coating development and erosion in a carbonate-rich shale," submitted April 2017, in review at *Environmental Science and Technology*.
2. Voltolini, M., Haboub, A., Dou, S., Kwon, T-H., MacDowell, A., Parkinson, D.Y., and **J. Ajo-Franklin**, "The Emerging Role of 4D Synchrotron X-Ray Micro-Tomography for Climate and Fossil Energy Studies: Present Capabilities at Beamline 8.3.3 at the Advanced Light Source" submitted April 2017, in review, at the *Journal of Synchrotron Radiation*.
3. Saltiel, S., Bonner B.P., Mittal, T., Delbridge, B., and **J.B. Ajo-Franklin**, "Experimental evidence for dynamic friction on rock fractures from frequency-dependent nonlinear hysteresis and harmonic generation," submitted April 2017, in review at *Journal of Geophysical Research – Solid Earth*.
4. Dou, S., Lindsey, N., Wagner, A.M., Daley, T.M., Freifeld, B., Robertson, M., Peterson, J., Ulrich, C., Martin, E.R., and J.B. Ajo-Franklin, "Distributed Acoustic Sensing for Seismic Monitoring of the Near Surface: A Traffic-Noise Interferometry Case Study," submitted March 2017, in review at *Scientific Reports*.
5. Marchesini, P., **Ajo-Franklin, J.B.**, and T. Daley, "In-situ measurement of velocity-stress sensitivity with crosswell CASSM," submitted March 2017, in review at *Geophysics*.
6. Voltolini, M., T-H. Kwon, and **J. Ajo-Franklin**, "Visualization and Prediction of Supercritical CO₂ Distribution in Sandstones during Drainage: An in situ Synchrotron X-Ray micro-Computed Tomography Study," submitted March 2017, in review at the *International Journal of Greenhouse Gas Control (IJGGC)*.
7. Zhu, T., **Ajo-Franklin, J.**, and T. Daley, "Spatio-temporal changes in seismic attenuation caused by injected CO₂ at the Frio-II pilot site, Dayton TX, USA," accepted/in revision April 2017 in *Journal of Geophysical Research – Solid Earth*.

8. Cheng, Y., Hubbard, C., Zheng, L., Arora, B., Li, L., Karaoz, U., **Ajo-Franklin, J.B.**, and N. Bouskill, 2017, "Next Generation Modeling of Microbial Souring – Parameterization through Genomic Information," accepted/in revision, *International Biodeterioration and Biodegradation*.
9. Saltiel, S., Bonner, B.P., and **J. Ajo-Franklin**, 2017, "Strain-dependent partial slip on rock fractures under seismic-frequency torsion," in press at *Geophysical Research Letters*.
10. **Ajo-Franklin, J.**, Voltolini, M., Molins, S., and L. Yang, "Coupled Processes in a Fractured Reactive System: A Dolomite Dissolution Study with Relevance to GCS Caprock Integrity," 2017, in review, *Caprock Integrity in Geological Carbon Storage [AGU Monograph]*, accepted, in press.
11. Beekingham, L.E., Steefel, C., Swift, A.M., Voltolini, M., Yang, L., Anovitz, L.M., Sheets, J.M., Cole, D.R., Kneafsey, T., Mitnick, E.H., Zhang, S., Landrot, G., **Ajo-Franklin, J.B.**, DePaolo, D.J., Mito, S., and Z. Xue, 2017, "Evaluation of accessible mineral surface areas for improved prediction of mineral reaction rates in porous media," *Geochemica et Cosmochimica Acta*, Vol. 205, pp. 31-49.
12. Zuo, L., **Ajo-Franklin, J.B.**, Voltolini, M., Geller, J.T., and S.M. Benson, 2017, "Pore-scale multiphase flow modeling and imaging of CO₂ exsolution in Sandstone," *Journal of Petroleum Science and Engineering*, accepted August 2016, in press.
13. Garing, C., de Chalendar, J.A., Voltolini, M., **Ajo-Franklin, J.B.**, and S.M. Benson, 2017, "Pore-scale capillary pressure analysis using multi-scale X-ray microtomography," *Advances in Water Resources*, Vol. 104, pp. 223-241.
14. Saltiel, S., Selvadurai, P.A., Bonner, B.P., Glaser, S.D., and **J.B. Ajo-Franklin**, 2017, "Experimental development of low-frequency shear modulus and attenuation measurements in mated rock fractures: shear mechanics due to asperity contact area changes with normal stress," *Geophysics*, Vol. 82, No. 2, pp. M19-M36.
15. Dou, S., Nakagawa, S., Dreger, D., and **J.B. Ajo-Franklin**, 2017, "An effective-medium model for P-wave velocities of saturated, unconsolidated permafrost," *Geophysics*, Vol. 82, No.3, pp. EN33-EN50.
16. Deng, H., Molins, S., Steefel, C., DePaolo, D., Voltolini, M., Yang, L., and **J.B. Ajo-Franklin**, 2016, "A 2.5 D Reactive Transport Model for Fracture Alteration Simulation," *Environmental Science and Technology*, Vol. 50, No. 14, pp. 756407571, DOI: 10.1021/acs.est.6b02184.
17. Cheng, Y., Hubbard, C., Li, L., Bouskill, N., Molins, S., Zheng, L., Sonnenthal, E., Engelbrekton, A., Coates, J.D., and **J.B. Ajo-Franklin**, 2016, "Understanding microbial reservoir souring and remediation: a reactive transport model of sulfur cycling as impacted by nitrate and perchlorate treatments," *Environmental Science and Technology*, Vol. 50, No. 13, pp. 7010-7018, DOI: 10.1021/acs.est.6b00081
18. Beekingham, L., Mitnick, E., Zhang, S., Voltolini, M., Swift, A.M., Yang, L., Cole, D.R., Sheets, J.M., Steefel, C.I., **Ajo-Franklin, J.B.**, DePaolo, D.J., Mito, S., and Z. Xue, 2016, "Evaluation of mineral reactive surface area estimates for prediction of reactivity of multi-mineral sediment," in review, *Geochemica et Cosmochimica Acta*, Vol. 188, No. 1, pp. 310-329.
19. Noh, D.-H., **Ajo-Franklin, J.B.**, Kwon, T.-H., and B. Mhunthan, 2016, "P- and S-wave Responses of Bacterial Biopolymer Formation in Unconsolidated Porous Media," *Journal of Geophysical Research – Biogeoscience*, Vol. 121, No. 4, pp. 1158-1177, DOI: 10.1002/2015JG003118
20. Dou, S., Dreger, D., Nakagawa, S., and **J.B. Ajo-Franklin**, 2016, "A rock physics investigation of unconsolidated saline permafrost: P-wave properties from laboratory ultrasonic measurements," *Geophysics*, [Cryosphere Special Issue], Vol. 81, No. 1, pp. WA233-WA245.
21. Berryman, J.G., Kwon, T.-H., Dou, S., **Ajo-Franklin, J.B.**, and S.S. Hubbard, 2015, "Analysis of laboratory data on ultrasonic monitoring of permeability reduction due to biopolymer formation in unconsolidated granular media," *Geophysical Prospecting*, doi: 10.1111/1365-2478.12295
22. Peet, K.C., Freedman, A.J.E., Hernandez, H.H., Britto, V., Boreham, C., **Ajo-Franklin, J.B.**, and J.R. Thompson, 2015, "Microbial growth under supercritical CO₂," *Applied and Environmental Microbiology*, Vol. 81, No. 8, pp. 2881-2892, doi:10.1128/AEM.03162-14.
23. Molins, S., Trebotich, D., Yang, L., **Ajo-Franklin, J.B.**, Ligocki, T.J., Shen, C., and C. Steefel, 2014, "Pore-scale controls on calcite dissolution rates from flow-through laboratory and numerical experiments," *Environmental Science and Technology*, Vol. 48, No. 13, pp. 7453-7460.
24. Hubbard, C.H., Cheng, Y., Engelbrekton, A., Druhan, J.L., Li, L., **Ajo-Franklin, J.B.**, Coates, J.D., and M.E. Conrad, 2014, "Isotopic insights into microbial sulfur cycling in oil reservoirs," *Frontiers in Microbiology*, Vol. 5, doi: 10.3389/fmicb.2014.00480

25. Dou, S. and **J.B. Ajo-Franklin**, 2014, "Full-wavefield inversion of surface waves for mapping embedded low-velocity zones in permafrost," *Geophysics*, Vol. 79, No. 6, pp. EN107-EN124.
26. Li, L., V. Surasani, **J. Ajo-Franklin**, C. Hubbard, S. Hubbard, Y. Wu, 2013, "Reactive Transport Modeling of Selective Bioclogging by *L. mesenteroides* at the Reservoir Scale," *Energy & Fuels*, Vol. 27, No. 11, pp. 6538-6551.
27. Kwon, T.L., and **J.B. Ajo-Franklin**, 2013, "High-frequency seismic response during permeability reduction due to biopolymer clogging in unconsolidated porous media," *Geophysics*, Vol. 78, No. 6, pp. EN117-EN127.
28. Daley, T.M., B.M. Friefeld, **J. Ajo-Franklin**, S. Dou, R. Pevzner, V. Shulakova, S. Kashikar, D. Miller, J. Goetz, J. Henninges, and S. Lueth, 2013, "Field testing of fiber-optic distributed acoustic sensing (DAS) for subsurface seismic monitoring," *The Leading Edge*, Vol. 32, No. 6, pp. 699-706.
29. Doetsch, J., M.B. Kowalsky, C. Doughty, S. Finsterle, **J.B. Ajo-Franklin**, C.R. Carrigan, X. Yang, S. D. Hovorka, and T.M. Daley, 2013, "Constraining CO₂ Simulations by coupled modeling and inversion of ERT and gas composition data," *International Journal of Greenhouse Gas Control (IJGGC)*, 2013, Vol. 18, pp. 510-522.
30. **Ajo-Franklin**, J.B., Peterson, J., Doetsch, J., and T.M. Daley, 2013, "High-Resolution Characterization of a CO₂ Plume Using Crosswell Seismic Tomography: Cranfield, MS," *International Journal of Greenhouse Gas Control (IJGGC)*, 2013, Vol. 18, pp. 497-509.
31. Kneafsey, T., Silin, D., and **J.B. Ajo-Franklin**, 2013, "Supercritical CO₂ flow through a layered silica sand/calcite sand system: Experiment and modified Maximal Inscribed Spheres analysis," *International Journal of Greenhouse Gas Control (IJGGC)*, Vol. 14, pp. 141-150
32. Landrot, G., **Ajo-Franklin**, J.B., Cabrini, S., and C.I. Steefel, 2012, "Measurement of the Reactive Surface Area Relevant to CO₂ Mineralization in a Reservoir," *Chemical Geology*, Vol. 318-319, p. 113-125
33. Noiriell, C., Steefel, C.I., Yang, L., and **J.B. Ajo-Franklin**, 2012, "Upscaling calcium carbonate precipitation rates from pore to continuum scale," *Chemical Geology*, Vol. 318-319, p. 60-74
34. Wu, Y., **Ajo-Franklin**, J.B., Spycher, N., Hubbard, S., Zhang, G., Williams, K., Taylor, J., Fujita, Y., and R. Smith, 2011, "Geophysical monitoring and reactive transport modeling of ureolytically-driven calcium carbonate precipitation," *Geochemical Transactions*, Vol. 12, No. 7
35. Armstrong, R. and **J.B. Ajo-Franklin**, 2011, "Investigating biomineralization using synchrotron based x-ray computed microtomography," *Geophysical Research Letters*, Vol. 38, No. L08406
36. Daley, T., **Ajo-Franklin**, J.B., and C. Doughty, 2011, "Constraining the reservoir model of an injected CO₂ plume with crosswell CASSM at the Frio-II Brine Pilot," *International Journal of Greenhouse Gas Control (IJGGC)*, Vol. 5, No. 2, pp. 1022-1030.
37. Minsley, B.J., **Ajo-Franklin**, J.B., Mukhopadhyay, A. and Morgan, F.D. 2011, "Hydrogeophysical Methods for Analyzing Aquifer Storage and Recovery Systems," *Ground Water*, Vol. 49, No. 2, pp. 250-269
38. Wu, Y., Hubbard, S.S., Williams, K.H., and **Ajo-Franklin**, J.B., 2010, "On the complex conductivity signatures of calcite precipitation," *JGR-Biosciences*, Vol. 115, No. G00G04
39. **Ajo-Franklin**, J.B., 2009, "Optimal Experiment Design for Timelapse Traveltime Tomography," *Geophysics*, Vol. 74, No.4, p. Q27-Q40
40. Lu, R., Willis, R.E., Campman, X., **Ajo-Franklin**, J.B., and Toksoz, M.N. 2008, "Redatuming through a Salt Canopy and Target Oriented Salt Flank Imaging," *Geophysics*, Vol. 73, No. 3, p. S63-S71
41. Daley, T.M., Solbau, R.D., **Ajo-Franklin**, J.B., and Benson, S.M. 2007, "Continuous Active-Source Seismic Monitoring of CO₂ Injection in a Brine Aquifer," *Geophysics*, Vol. 72, No. 5, p. A57-A61
42. **Ajo-Franklin**, J.B., Minsley, B.J., and Daley, T.M. 2007, "Applying Compactness Constraints to Differential Traveltime Tomography," *Geophysics*, Vol. 72, No. 4, p. R67-R75
43. **Ajo-Franklin**, J.B., Geller, J.T., and Harris, J.M. 2007. "The Ultrasonic Properties of Granular Media Saturated With DNAPL/Water Mixtures," *Geophysical Research Letters*, Vol. 34, No. 17, L07404
44. **Ajo-Franklin**, J.B., Urban, J.A., and Harris, J.M. 2006. "Using Resolution-Constrained Adaptive Meshes For Traveltime Tomography," *Journal Of Seismic Exploration*, Vol.14, pp. 371-390

45. **Ajo-Franklin, J.B.**, Geller, J.T., and Harris, J.M. 2006. "A Survey Of The Geophysical Properties of Dense Chlorinated Solvents," *Journal Of Applied Geophysics*, Vol. 59, No.3, pp. 177-189
46. **Ajo-Franklin, J.B.**, Geller, J.T., and Harris, J.M. 2004. "The Dielectric Properties of Granular Media Saturated With DNAPL/Water Mixtures," *Geophysical Research Letters*, Vol. 31, No. 17, L17501
47. **Franklin, J.B.** and Harris, J.M. 2001. "A High-Order Fast Marching Scheme for the Linearized Eikonal Equation," *Journal of Computational Acoustics*, Vol.9, No.3, pp. 1095-1109

SELECTED EXTENDED ABSTRACTS

1. Dou, S., **Ajo-Franklin, J.**, Daley, T., Robertson, M., Wood, T., Freifeld, B., Pevzner, R., Correa, K.T., Urosevic, M., and B. Gurevich, (2016), "Surface orbital vibrator (SOV) and fiber-optic DAS: Field demonstration of economical continuous seismic time-lapse monitoring from the Australian CO2CRC Otway site," Extended abstract presented at the *Society of Exploration Geophysics Annual Meeting 2016*, Dallas, TX, Oct. 16th-20th.
2. **Ajo-Franklin, J.**, Lindsey, N., Dou, S., Daley, T.M. Freifeld, B., Martin, E.R., Robertson, M., Ulrich, C., Wagner, A., (2015), "A Field Test of Distributed Acoustic Sensing for Ambient Noise Recording," Extended abstract presented at the *Society of Exploration Geophysics Annual Meeting 2015*, New Orleans, LA., Nov. 4th-8th.
3. Martin, E.R., **Ajo-Franklin, J.**, Dou, S., Lindsey, N., Daley, T.M., Freifeld, B., Robertson, M., Wagner, A., and C. Ulrich, (2015), "Interferometry of ambient noise from a trenched distributed acoustic sensing array," Extended abstract presented at the *Society of Exploration Geophysics Annual Meeting 2015*, New Orleans, LA., Nov. 4th-8th.
4. Dou, S. and **Ajo-Franklin, J.** (2012), "Seismic Surface Wave Investigations of Deep Low-Velocity Zones in Arctic Coastal Permafrost near Barrow, Alaska," Extended abstract, presented at the the *SEG/AGU Cryosphere Workshop*, Boise, ID, Jan. 6th-8th.
5. Dou, S., and **Ajo-Franklin, J.** (2012), "Application of Surface-Wave Methods to Imaging Subsurface Properties in Permafrost Soils," Extended abstract presented at the *Society of Exploration Geophysics Annual Meeting 2012*, Las Vegas, NV, Nov. 4th-8th.
6. D.M. Ushizima, D. Parkinson, P. Nico, **J.B. Ajo-Franklin**, A. MacDowell, B. Kocar, W. Bethel, and J. Sethian (2011), "Statistical segmentation and porosity quantification of 3D x-ray microtomography," Society of Photo-Optical Instrumentation Engineers (SPIE).
7. Kwon, T.H. and **J.B. Ajo-Franklin** (2011), "Seismic monitoring of permeability reduction due to biopolymer formation in unconsolidated materials," *Society of Exploration Geophysicists Annual Meeting 2011*
8. **Ajo-Franklin, J.B.**, T.M. Daley, B. Butler-Veytia, J. Peterson, Y. Wu, B. Kelley, and S. Hubbard (2011), "Multi-level continuous active source seismic monitoring (ML-CASSM): Mapping shallow hydrofracture evolution at a TCE contaminated site," *Society of Exploration Geophysicists Annual Meeting 2011*, [Selected as *Best Paper* from Conference]
9. Hovorka, S.D., T.A. Meckel, R.H. Trevino, J. Lu, J-P. Nicot, J.W. Choi, D. Freeman, P. Cook, T.M. Daley, **J.B. Ajo-Franklin**, B.M. Freifeld, C. Doughty, C.R. Carrigan, D. La Brecque, Y.K. Kharaka, J.J. Thordsen, T.J. Phelps, C. Yang, K.D. Romanak, T. Zhang, R. M. Holt, J.S. Lindler, and R. Butsch (2011), "Monitoring a large volume CO₂ injection: Year two results from SECARB project at Denbury's Cranfield, Mississippi, USA," *Energy Procedia*, Vol. 4, 2011, pp. 3478-3485, *Proceedings of the 10th International Conference on Greenhouse Gas Control Technologies*
10. Silin, D., T.J. Kneafsey, **J.B. Ajo-Franklin**, and P. Nico (2011), "A Multimodal Imaging Study of Natural Gas Flow in Tight Sands," *SPE Annual Technical Conference and Exhibition*, to appear Oct. 2011
11. Daley, T.M., **Ajo-Franklin, J.B.**, and C. Doughty (2008), "Integration of crosswell CASSM (Continuous Active Source Seismic Monitoring) and flow modeling for imaging of a CO₂ plume in a brine aquifer," *78th Ann. Internat. Mtg. Soc. Of Expl. Geophys. (SEG)*.
12. Zhang, Y., **Ajo-Franklin, J.B.**, and M.N. Toksoz (2007), "Relative particle motions of fluid and solid phases in porous media: A numerical study of seismic scattering in digitized granular models," *77th Ann. Internat. Mtg. Soc. Of Expl. Geophys. (SEG)*.

13. Lu, R., Willis, M.E., Campman, X., **Ajo-Franklin, J.**, and M.N. Toksoz (2007), "Redatumming through a salt canopy – Another salt-flank imaging strategy," *77th Ann. Internat. Mtg. Soc. Of Expl. Geophys. (SEG)*.
14. **Ajo-Franklin, J.B.**, Urban, J., and Harris, J.M. (2005), "Temporal Integration of Seismic Traveltime Tomography," *75th Ann. Internat. Mtg. Soc. Of Expl. Geophys. (SEG)*.
15. **Ajo-Franklin, J.B.**, Geller, J.T., Majer, E.L., Peterson, J.E., Williams, K., and Harris, J.M. (2003), "Preliminary Characterization of a NAPL-Contaminated Site using Borehole Geophysical Techniques," *Symp. App. Geop. Envi. Eng. Prob. (SAGEEP), EEGS*
16. **Franklin, J.**, (1997), "Minimum traveltime calculations in anisotropic media using graph theory". *67th Ann. Internat. Mtg. Soc. Of Expl. Geophys. (SEG)*.

RECENT INVITED PRESENTATIONS

1. **Ajo-Franklin, J.B.**, "Advancing time-lapse seismic acquisition with semi-permanent source and receiver arrays: CASSM and DAS for seismic monitoring," Jan. 2016, Invited talk at Lawrence Livermore National Laboratory, Seismology Group.
2. **Ajo-Franklin, J.B.**, "Monitoring Thermo-mechanical Alteration of Source Rock at the Micron Scale," Jan. 2016, Invited Talk, Stanford University (STEMS Workshop, ERE).
3. **Ajo-Franklin, J.B.**, "Advancing time-lapse seismic acquisition with semi-permanent source and receiver arrays: CASSM and DAS for seismic monitoring," Mar. 2015, Invited talk at Sandia National Laboratory, Geophysics Dept.
4. **Ajo-Franklin, J.B.**, "Continuous Active Source Seismic Monitoring (CASSM): Applications in Monitoring CO₂ Sequestration and Hydraulic Fracture Evolution [2 Case Studies]," Feb. 2015, Invited talk at Stanford University (Department of Geophysics).
5. **Ajo-Franklin, J.B.**, "Coupled Multiphase Flow and Chemistry at the Micron Scale Research in Pore-Scale Processes Conducted at Center for Nanoscale Control of Geologic CO₂ (NCGC)," Feb. 2013, Invited Plenary Speaker, Montana State University (Annual Earth Science Colloquium)
6. **Ajo-Franklin, J.B.**, "Continuous Active Source Seismic Monitoring (CASSM): Applications In Monitoring CO₂ Sequestration and Hydraulic Fracture Evolution [2 Case Studies]," June 2012, Invited talk at Stanford University (Environmental Fluid Mechanics and Hydrology Laboratory)
7. **Ajo-Franklin, J.B.**, "Continuous Active Source Seismic Monitoring (CASSM): Applications In Monitoring CO₂ Sequestration and Hydraulic Fracture Evolution [2 Case Studies]," June 2012, Invited talk at the University of California, Berkeley (Berkeley Seismological Laboratory)
8. **Ajo-Franklin, J.B.**, "Using Synchrotron Micro Tomography for Pore-Scale Monitoring of Super-Critical CO₂ Flow: Challenges for Dynamic Datasets," October, 2012, Invited talk at the Advanced Light Source User Meeting (Workshop on Microtomography)
9. **Ajo-Franklin, J.B.**, "Using Synchrotron Micro Tomography for Pore-Scale Monitoring of scCO₂ Flow and CaCO₃ Precipitation: Implications for Rock Physics," Invited Talk at the SEG Annual Meeting Workshop, San Antonio, TX, Sept. 22nd, 2011
10. **Ajo-Franklin, J.** and Daley, T., "Using Optimal Design to Improve CO₂ Sequestration Monitoring Strategies," Geologic Carbon Sequestration Site Integrity: Characterization and Monitoring Workshop, Columbus OH, June. 7-8, 2010
11. **Ajo-Franklin, J.**, Magnant, Z., and Daley, T., "Using Optimal Design to Improve CO₂ Sequestration Geophysical Monitoring Strategies," CO₂ Sequestration Geophysics: SEG 2009 Summer Research Workshop Banff, Canada, August 23-27, 2009

WHITE PAPERS, TECHNICAL REPORTS, & BOOK CHAPTERS

1. **Ajo-Franklin, J.**, L. Anovitz, I. Bourg, A. Chialvo, D. Cole, T.W. Kim, G. Rother, G. Sposito, T. Tokunaga, L. Vlcek, and J. Wan, (2011), "Caprock Integrity in the Geologic Sequestration of Carbon Dioxide," Center for the Nanoscale Control of Geologic CO₂, Whitepaper #1
2. Silin, D., T.J. Kneafsey, **J.B. Ajo-Franklin**, and P. Nico (2010), "Pore-scale mechanisms of gas flow in tight sand reservoirs," Technical Report LBNL-4103E, Nov. 2010

3. Nico, P. S., **Ajo-Franklin, J. B.**, Benson S. M., MacDowell, A., Silin, D. B., Tomutsa, L. and Wu, Y. Synchrotron X-ray Micro-Tomography and Geological CO₂ Sequestration. In *Advances in Computed Tomography for Geomaterials, GeoX 2010*. Ed. Khalid A. Alshibi and Allen H. Reed. Wiley, & Sons, Hoboken, NJ, p. 374-380, 2010, [Book Chapter]

SELECTED CONFERENCE ABSTRACTS & POSTERS

1. Dou, S., Dreger, D.S., Peterson, J., Ulrich, C., Dafflon, B., Hubbard, S.S., and **J.B. Ajo-Franklin**, "Wavefield Inversion of Surface Waves for Delineating Seismic Structure in Saline Permafrost: A Case History from the Barrow Peninsula, AK," American Geophysical Union, Fall Meeting, 2014.
2. Beckingham, L.E., Zhang, S., Mitnick, E., Cole, D.R., Yang, L., Anovitz, L.M., Sheets, J., Swift, A., Kneafsey, T.J., Landrot, G., Mito, S., Xue, Z., Steefel, C., DePaolo, D.J., and **J.B. Ajo-Franklin**, "The role of advanced reactive surface area characterization in improving predictions of mineral reaction rates," American Geophysical Union, Fall Meeting, 2014.
3. Voltolini, M., Yang, L., and **J.B. Ajo-Franklin**, "The Evolution of a Fracture in a Dolomite Sample During Dissolution Induced by a CO₂-Saturated Solution Flow at Reservoir Conditions: a Dynamic Synchrotron X-Ray Microtomography Study," American Geophysical Union, Fall Meeting, 2014.
4. **Ajo-Franklin, J.B.**, Daley, T.M., Freifeld, B.M., Tang, D.G., Zhang, R., Wagner, A.M., Dou, S., Bjella, K., and R. Pevzner, "Development of a surface-wave imaging system for geotechnical applications based on distributed acoustic sensing (DAS) and ambient noise interferometry," American Geophysical Union, Fall Meeting, 2014.
5. Dou, S., and **Ajo-Franklin, J.** (2012), "Mapping Deep Low Velocity Zones in Alaskan Arctic Coastal Permafrost using Seismic Surface Waves," Abstract presented at *2012 Fall Meeting, American Geophysical Union*, San Francisco, CA, Dec. 2nd-7th.
6. J. Doetsch, M.B. Kowalsky, C. Doughty, S. Finsterle, **J.B. Ajo-Franklin**, X. Yang, C.R. Carrigan, and T.M. Daley (2012) "Fully coupled hydrogeophysical inversion of CO₂ migration data in a deep saline aquifer" SEG-AGU Hydrogeophysics workshop in Boise, ID, July 2012.
7. MacDowell, A., Parkinson, D., Haboub, A., Schaible, E., Nasiatka, J., Bale, H., Ritchie, R., and **J. Ajo-Franklin** (2012), "X-ray micro-Tomography at the Advanced Light Source," SPIE.
8. Beyer, J.H., **Ajo-Franklin, J.**, Ali, S., and Burton, E., (2011), "WESTCARB Geologic Characterization Well in Northern California's Natural Gas Province," *10th Annual Conference on Carbon Capture, Utilization, and Sequestration*, Pittsburgh, PA, May, 2012.
9. Daley, T.M., **J.B. Ajo-Franklin**, C. Doughty, and S. Hovorka (2011), "Seismic Monitoring at SECARB's Phase-III Cranfield Site – Initial Results," *10th Annual Conference on Carbon Capture and Sequestration*, Pittsburgh, PA, May, 2011.
10. **Ajo-Franklin, J.**, Daley, T., Butler-Veytia, B., Peterson, J.E., Gasperikova, E., Wu, Y., Kelley, B., and S. Hubbard, (2011), "Acquisition and integrated inversion of a continuous active source seismic monitoring (CASSM) dataset: Application to shallow hydrofracture evolution," Abstract H52C-03, presented at *2011 Fall Meeting, American Geophysical Union*, San Francisco, CA, 5-9 Dec.
11. Daley, T.M., **Ajo-Franklin, J.B.**, and F. Niu, (2011), "Recent Results from Crosswell CASSM (Continuous Active-Source Seismic Monitoring)," Abstract T51I-04, presented at *2011 Fall Meeting, American Geophysical Union*, San Francisco, CA, 5-9 Dec.
12. Freedman, A.J., Peet, K.C., **Ajo-Franklin, J.B.**, Ajo-Franklin, C., Cappuccio, J.A., and J.R. Thompson (2011), "Characterization of microbe-mineral interaction under supercritical CO₂: Possible roles for bacteria during geologic carbon sequestration," Abstract B51J-0546, presented at *2011 Fall Meeting, American Geophysical Union*, San Francisco, CA, 5-9 Dec.

13. Kowalsky, M.B., Commer, M., **Ajo-Franklin, J.B.**, Doughty, C., Daley, T.M., and S. Finsterle, (2012), "Feasibility of coupled hydrogeophysical inversion for characterization and monitoring of subsurface CO₂ injection," Abstract H42F-02, presented at *2011 Fall Meeting, American Geophysical Union*, San Francisco, CA, 5-9 Dec. (invited)
14. Steefel, C., Yang, L., Noiriell, C.N., and **J.B. Ajo-Franklin**, (2011), Upscaling Carbonate Precipitation associated with CO₂ Sequestration from Pore to Continuum Scale, Abstract H53L-03, presented at *2011 Fall Meeting, American Geophysical Union*, San Francisco, CA, 5-9 Dec. (invited)
15. **Ajo-Franklin, J.B.**, T.M. Daley, B. Butler-Veytia, J. Peterson, E. Gasperikova, and S.S. Hubbard (2010), "Multi-level continuous active source seismic monitoring (ML-CASSM): Application to shallow hydrofracture monitoring," Abstract NS44A-04 presented at *2010 Fall Meeting, American Geophysical Union*, San Francisco, CA, Dec. 13-17.
16. Noiriell, C., L. Yang, **J. Ajo-Franklin**, and C. Steefel, (2010), "Impact of carbonate precipitation on flow and reactive transport in porous media," Abstract H13B-0961 presented at *2010 Fall Meeting, American Geophysical Union*, San Francisco, CA, Dec. 13-17.
17. Silin, D., **J.B. Ajo-Franklin**, S. Cabrini, T.J. Kneafsey, A. MacDowell, P.S. Nico, and V. Radmilovic (2010), "Pore-scale studies of gas shale," Abstract MR22C-03 presented at *2010 Fall Meeting, American Geophysical Union*, San Francisco, CA, Dec. 13-17.
18. Wu, Y., S.S. Hubbard, **J.B. Ajo-Franklin**, and K.H. Williams (2010), "Pore fluid chemistry and spectral induced polarization signatures of calcium carbonate," Abstract NS33A-06 presented at *2010 Fall Meeting, American Geophysical Union*, San Francisco, CA, Dec. 13-17.
19. Molins, S., **J.B. Ajo-Franklin**, R.T. Armstrong, P.S. Nico, and D. Silin (2010), "Biogeochemically-driven evolution of pore structures and flow paths: experimental studies and modeling," Abstract H14D-1110 presented at *2010 Fall Meeting, American Geophysical Union*, San Francisco, CA, Dec. 13-17.
20. Steefel, C., C.N. Noiriell, L. Yang, D. Trebotich, S. Molins, and **J.B. Ajo-Franklin** (2010), "Integrating Experiments, Characterization, and Modeling to Understand Carbonate Precipitation at the Pore Scale," Abstract H11K-03 presented at *2010 Fall Meeting, American Geophysical Union*, San Francisco, CA, Dec. 13-17 (invited).
21. Meckel, T., Hovorka, S. D., **Ajo-Franklin, J.**, and Reiter, D., 2010, "Downhole passive microseismic observations during continuous CO₂ injection at Cranfield, Mississippi" (abs.): *American Association of Petroleum Geologists Annual Convention & Exhibition*, v. 19, p. 169.
22. Daley, T.M., Majer, E., Hoversten, M., Gritto, R. and **Ajo-Franklin, J.**, 2010, "Borehole Seismic Monitoring of Sequestration Pilots," *Geologic Carbon Sequestration Site Integrity: Characterization and Monitoring Workshop*, Columbus, Ohio, June 7-8, 2010.
23. Silin, D., Kneafsey, T., **Ajo-Franklin, J.**, and Nico, P. 2010, "Three-Dimensional Imaging of Tight Gas Host Rock – Observations and Conceptual Models". *Goldschmidt 2010 Conference*, Knoxville, TN, June 13-18, 2010.
24. Wu, Y., Ajo-Franklin, J., Armstrong, R., and Hubbard S.S., 2010, Noninvasive Geophysical Imaging of Ureolytic CaCO₃ Precipitation, *Goldschmidt 2010 Conference*, Knoxville, TN, June 13-18, 2010.
25. **Ajo-Franklin, J.**, Magnant, Z, and Daley, T. 2009, "Using Optimal Design to Improve CO₂ Sequestration Geophysical Monitoring Strategies," *CO₂ Sequestration Geophysics: SEG 2009 Summer Research Workshop*, Banff, Canada, August 23-27, 2009.

26. Armstrong, R.T. and **Ajo-Franklin J.B.**, 2009, Probing the Dynamics of Biomineralization at the Pore Scale Using X-ray Computed Tomography, Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract H13C-0976.
27. Silin, D., **Ajo Franklin, J. B.**, Cabrini, S., Kneafsey, T. J., MacDowell, A. Nico, P. S., and Tomutsa, L., 2009, Pore-scale studies of unconventional reservoir rocks. Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract H23F-1018, 2009.
28. Wu, Y., Hubbards, S.S., Williams, K.H., and **Ajo-Franklin J.B.**, 2009, Complex conductivity signatures of CaCO₃ precipitation and its mixture with FeS, Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract H43C-1042.
29. Hubbard, S.S., Wu, Y., Chen, J., **Ajo-Franklin, J.B.**, Li, L., Tugulus, C., and Williams, K.H., 2009, Assessing Feedbacks between Remediation-Induced Biogeochemical Transformations and Flow Characteristics using Multi-Scale Geophysical Approaches, Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract H53J-02.
30. Daley, T.M., Niu, F., **Ajo-Franklin, J.B.**, Solbau, R., Silver, P.G., 2009, Crosswell CASSM (Continuous Active-Source Seismic Monitoring): Recent Developments, Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract NG22A-06.
31. **Ajo-Franklin, J.B.**, MacDowell, A., and Nico, P.S., 2009, "Evolution of Pore Structures and Flowpath Challenge: Dynamic Synchrotron Imaging of Pore Structure Evolution," ERSP PI Meeting, Lansdowne, VA, April 20-23, 2009.
32. **Ajo-Franklin, J.**, Wu, Y., Hubbard, S.S., and Nico, P., 2008, Using Synchrotron Micro-CT to Monitor Microbially-Induced Calcite Precipitation on the Pore Scale, AGU Biogeophysics Chapman Conference, Portland, ME, Oct. 13-16, 2008.
33. Wu, Y., **Ajo-Franklin, J.**, Williams, K., Hubbard, S.S., 2008, Geoelectrical signatures from ureolytically driven calcite precipitation processes---- Part I: low level precipitation and role of ion exchange, AGU Biogeophysics Chapman Conference, Portland, ME, Oct. 13-16, 2008.
34. Daley, T.M., Sherlock, D., Freifeld, B., **Ajo-Franklin, J.**, and Sharma, S., 2008, "Monitoring of CO₂ Sequestration in a Depleted Gas Reservoir: The Otway Project," SEG/EAGE Summer Research Workshop, Vancouver, September.

AWARDS AND FELLOWSHIPS

Best Paper Award, GRC (2016): (Lead author H. Knox)
 R&D 100 Award for development of CASSM (2015): w. T. Daley and E. Majer
 Best Paper Award, SEG Annual Meeting (2011)
 Founding Member Fellow, Earth Resources Laboratory, MIT (2005-2007)
 Chair's Fellowship for Intergroup Research, Stanford (2002-2003)
 EPA STAR Fellow (2001-2004)
 Samuel P. Worden Award for Geophysical Research, Rice University (1997)

PROFESSIONAL ACTIVITIES

Society for Exploration Geophysics: District 3 Representative, SEG Council (2015-Present)
 Associate Editor for *Geophysics* (2011-2016)
 Special Editor for *Geophysics* (2009-2011)
 AGU Near-Surface Geophysics Focus Group, Committee Member
 AGU Hydrogeophysics Technical Committee, Member
 Reviewer for: *Geophysics*, *Geophysical Research Letters*, *Geophysical Journal International*
 Member of SEG, AGU (Near-Surface Focus Group)

RECENTLY FUNDED PROPOSALS (EXTERNAL)

1. "Dynamic Micro-Tomographic Imaging of Thermomechanical Fracture Networks During Type I Source Rock Maturation and Oil Shale Pyrolysis," Lead PI, \$287K/yr, 2015-2017 (WFO, Total E&P).
2. "Imaging Fracture Networks Using Joint Seismic and Electrical Change Detection Techniques," Co-PI (H. Knox, Lead PI), \$1000K/yr (\$220K/yr Task Budget), 2016-2017 (DOE EERE/GTO)
3. "Engineering thermophilic microorganisms to selectively extract strategic metals from low temperature geothermal brines," Co-PI (C. Ajo-Franklin, Lead PI), \$243K/yr (80 K/yr Task Budget), 2015-2017 (DOE EERE/GTO)
4. "Developing Smart Infrastructure for a Changing Arctic Environment using Distributed Fiber-Optic Sensing Methods," Lead PI, \$667K/yr, 2014-2018 (DOD/SERDP)
5. "Modeling and Monitoring Core: Soured Systems Biology Program," Lead PI, \$550K/yr, 2012-2017, (WFO Energy Bioscience Institute/BP)
6. "Fossil Fuel Microbiology: Investigational Biosurfactant Studies," Lead PI, \$84K/yr, 2015, (WFO Energy Bioscience Institute/BP)
7. "Geophysical Characterization of Microbial Activity in Reservoir Rocks for Enhanced Hydrocarbon Recovery" Lead PI, \$330K/yr, 2009-2011 (WFO, Energy Bioscience Institute/BP)
8. "Geophysical Imaging for Investigating the Delivery and Distribution of Amendments in the Heterogeneous Subsurface of the FE. Warren AFB," Co-PI with S. Hubbard, \$414k/yr, 2008-2012 (DOD/ESTCP)
9. "Big Sky Regional Sequestration Partnership, Kevin Dome Pilot: LBNL," Co-I, Lab/MVA Lead(Curt Oldenburg, Lead PI), Task Budget, \$135K/yr, 2009-2016. (DOE FE)
10. "Next-Generation Ecosystem Experiment - Arctic," Co-I (Stan Wullshlager, Lead PI), Task Budget, \$110k/yr, 2012-2014 (DOE BER)
11. "Center for the Nanoscale Control of Geologic CO₂," Theme Leader (D. DePaulo, Lead PI), Task Budget \$220k/yr, 2008-2013 (DOE BES)
12. "Center for the Nanoscale Control of Geologic CO₂: Phase 2," Thrust Leader (D. DePaulo, Lead PI), Task Budget \$220k/yr, 2014-2018 (DOE BES)
13. "Crosswell EM System Development Project," Lead PI. \$80K/yr 2012-2013 (WFO, Advanced Energy Consortium)
14. "West Coast Regional Partnership WESTCARB: LBNL," Co-I, Lab/MVA Lead (J. Beyer, Lead PI), \$200 K/yr, 2011-2014, (DOE-FE)
15. "SECARB Phase III Monitoring Project: LBNL," Co-I, (T. Daley, LBNL Lead PI), \$110K/yr, 2010-2012, (DOE FE)

FUNDED PROPOSALS (INTERNAL/LDRD)

1. Dark Fiber [lead PI Jonathan Ajo-Franklin, Co-PIs B. Freifeld, T. Daley] (2016-2018)
2. Integrative mapping of soil heterogeneity at the microbial scale. [Lead PI, Eoin Brodie] Co-PI, Jonathan Ajo-Franklin (2012-2014).
3. X-ray Fluorescence Tomography – 3D elemental mapping. [Lead PI, Alastair MacDowell] Co-PI Jonathan Ajo-Franklin (2011-2013)

APPROVED USER FACILITY PROPOSALS

1. Advanced Light Source (LBNL), Beamline 8.3.2, Approved Program Lead-PI (w. P. Nico and C. Steefel), 60 shifts/yr, 2014-2017.
2. Advanced Light Source (LBNL), Beamline 8.3.2, Approved Program Co-PI (w. P. Nico and C. Steefel), 60 shifts/yr, 2009-2013.
3. High Flux Isotope Reactor (ORNL), Beamline CG1-D, Approved Proposal, LPI (w. L. Anovitz), 6 shifts, 2012
4. National Energy Research Science Computing Center (LBNL), Production Run 86249 (2013), 100,000 core hours. "Rock Properties for scCO₂ Transport and Reactions in Geological Systems: Image Processing and Modeling" (LPI)
5. National Energy Research Science Computing Center (LBNL), Production Run 87125 (2014), 250,000 core hours. "Rock Properties for scCO₂ Transport and Reactions in Geological Systems: Image Processing and Modeling" (LPI)

6. Molecular Foundry, User Proposal #1671, “ Continued nanometer-scale studies of shales for carbon sequestration and gas recovery (Co-PI w. T. Kneafsey)
7. Molecular Foundry, User Proposal #906, “Investigation of nano-to-micron scale CaCO₃ bioprecipitates: morphology and properties”. (LPI)
8. Molecular Foundry, User Proposal #744, “Petrophysical studies of unconventional gas reservoirs using high-resolution rock imaging” (Co-PI w. D. Silin)

ADVISED STUDENTS & POSTDOCTORAL FELLOWS

Zhuojun Magnant, PhD. Student, Emory University (Computer Science), June 2009-2010

Research topic: experiment design methods applied to sparse array optimization,

Currently Assoc. Prof., Georgia Southern University

Ryan Armstrong, PhD. Student, Oregon State University, June 2009-Jan. 2010

Research topic: Synchrotron imaging of microbial precipitation and growth processes in porous materials.

Currently Asst. Prof, University of New South Wales

Tae-Hyuk Kwon, Post Doctoral Scientist, LBNL, 2009-2011

Research topic: Geophysical monitoring of microbially-enhanced oil recovery,

Currently Asst. Prof., Korea Advanced Institute of Science & Technology (KAIST)

Lauren Beckingham, Postdoctoral Scientist, LBNL, 2012-2015

Research topic: Reactive surface area of multimineralic systems

Currently Asst. Prof, Auburn University, USA

Shan Dou, PhD Student, University of California, Berkeley (EPS), 2011-2015

Research topic: Seismic investigation of permafrost properties

Currently Postdoctoral Fellow, Lawrence Berkeley National Laboratory

Seth Saltiel, PhD Student, University of California, Berkeley (EPS), 2012-Present

Research topic: Low-frequency shear measurement techniques for GCS

Nathaniel Lindsey, PhD Student, University of California, Berkeley (EPS), 2015-Present

Research topic: Distributed acoustic sensing methods for near-surface characterization

Marco Voltolini, Geological Project Scientist, LBNL, 2012-Present

Research topic: Synchrotron imaging of scCO₂ flow and reactions in reservoir sandstones

David Tang, M.S. Student, University of California, Berkeley (CEE), 2012-Present

Research topic: Seismic monitoring of scCO₂ injection at the King Island test site

Currently PhD Student, University of Texas, Austin

Bridget Floyd, Undergraduate Researcher, University of California, Berkeley (EPS), 2012-2013

Currently Staff Geologist, USACE.

Ruxun Zhang, Undergraduate Researcher, University of California, Berkeley (EPS), 2013-Present

Ian Ekblaw, Undergraduate Researcher, University of California, Berkeley (EPS), 2016-Present

METRICS

45 Peer-reviewed Journal Publications

992 citations, 812 since 2012 (*Google Scholar*)

H Factor = 19 (*Google Scholar*)

i-10 index = 28 (*Google Scholar*)

TEACHING

2017: Carbon Capture and Sequestration (Berkeley Energy Lectures), Chem Eng 195 (cross-listed in Earth and Planetary Science), University of California Berkeley
[Co-taught with M. Went, C. Oldenburg, and B. Smit]

2016: Carbon Capture and Sequestration (Berkeley Energy Lectures), Chem Eng 195 (cross-listed in Earth and Planetary Science), University of California Berkeley
[Co-taught with M. Went, C. Oldenburg, and B. Smit]

2015: Carbon Capture and Sequestration (Berkeley Energy Lectures), Chem Eng 295Z (cross-listed in Earth and Planetary Science), University of California Berkeley
[Co-taught with M. Went, C. Oldenburg, J. Reimer and B. Smit].

2014: Carbon Capture and Sequestration (Berkeley Energy Lectures), Chem Eng 295Z (cross-listed in Earth and Planetary Science), University of California Berkeley
[Guest Lecturer]

LABORATORY & DIVISIONAL SERVICE

Lab Lead PI: Applied and Environmental Geophysics Laboratory (EAGLe)
EESA/EGD Awards Committee (Chair, 2014-Present)
ESD Divisional Capital Equipment Committee (2010-Present)
ESD Distinguished Seminar Series Committee (2010-Present)
ESD B74 Move Committee, Geophysics Representative (2012-2013)
LBNL Open House (2011-2012)
SAC Committee Member for EETD EHS Review (2012)
SAC Sub-Committee Member for Safety Assurance (2014)
SAC Sub-Committee Member for Pressure Safety (2014-2016)

RECENT FIELD RESEARCH PROJECTS

SIGMA-V Geothermal Fracture Pilot (Sanford Underground Research Facility, SD, T. Kneafsey, PI)
SERDP Permafrost DAS Pilot (Fairbanks, AK, J. Ajo-Franklin, PI)
SURF/KisMET SubTER Fracture Pilot (Sanford Underground Research Facility, SD, C. Oldenburg, PI)
Blue Canyon Fracture Pilot (Socorro, NM, H. Knox, PI)
Frio II Brine Sequestration Pilot (Liberty, TX, S. Hovorka, PI)
SECARB Stacked Storage Test, Phase III (Cranfield, MS, S. Hovorka, PI)
Warren AFB Hydraulic Fracture Pilot (Cheyenne, WY, J. Ajo-Franklin & S. Hubbard, Co-PIs)
WESTCARB Sacramento Basin Characterization Project (J.H. Beyer, PI)
Kevin Dome Large Scale Storage Test, Big Sky Partnership (Kevin Dome, MT, L. Spengler, PI)